
# MD 24 (Rocks Road) Slope Repair Challenges

## Summary of Concepts

# Overview

- Regulatory Process
- Briefing on Scientific Studies
- Concepts Results
- Summary

Purpose of this project is preserve the roadway infrastructure and ensure the public safety.

(the slope is deficient and unsafe.)

# Regulatory Processes

- Clean Water Act
  - Section 404 – Wetland and Waterway Permit
  - Alternative Analysis
  - Avoid, Minimize, Mitigate.
  - 'A fundamental precept of the 404 program is -if aquatic impacts can be avoided, they should be avoided'
- Comments from MDE, DNR , USFWS, US Army Corps of Engineers

**National Environmental Policy Act (Section G)**

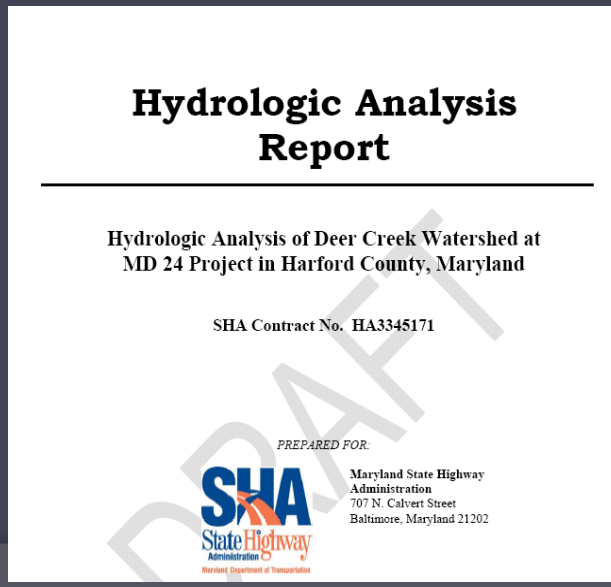
- Categorical Exclusion
- Section 4f

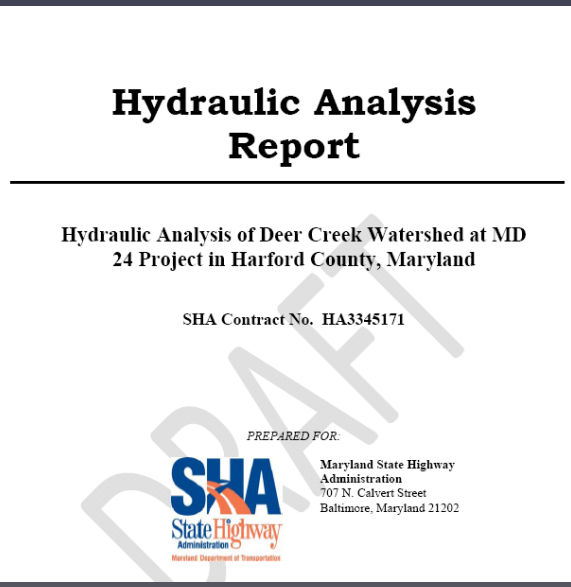
**Maryland Environmental Policy Act (Section A)**

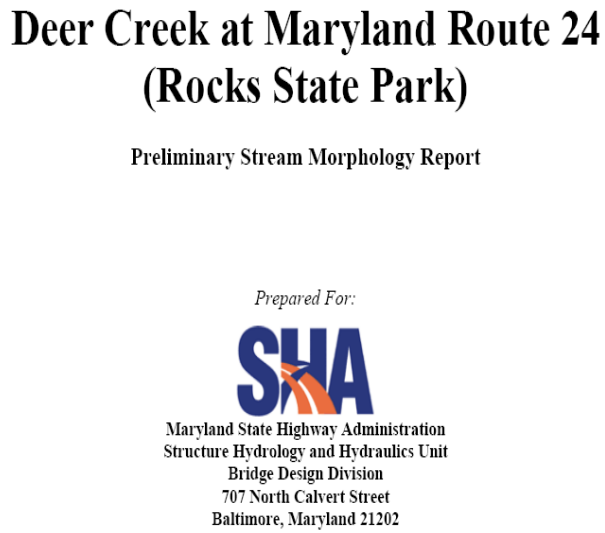
- Evaluation of Impacts

# Engineering & Scientific Studies

- **Hydrology**
  - Rain
  - Flood potential
  - Storm flows
- **Preliminary Geomorphic Report (draft from only)**
  - Stream geometry
  - Migration pattern
  - Stream characteristics
- **Hydraulics**
  - Channel Characteristics
  - Channel Velocity and stresses
  - Water level in river
- **Geotechnical**
  - Soil composition
  - Location of Bedrock
  - Ground penetration radar (Seismic)



# Evaluation of Deer Creek within Area of Interest

The existing conditions of Deer Creek were found to be incised, degraded and laterally unstable. The effects of past channel manipulation from damming, channel relocation, railroad impacts, and roadway infrastructure within a confined valley setting have contributed to past stream degradation and is likely to contribute to ongoing degradation in the future. **This process of channel migration should be expected to continue for the foreseeable future**.

*- From SHA Geomorphic Study*


# Concepts

- No-Build
- Minimum Shift
- Maximum Shift
- Slope Stabilization

# No-Build

## Routine Maintenance

- SHA is required to address deficiencies in the infrastructure to ensure public safety.
- SHA has identified deficiencies in the infrastructure.

Eventually routine maintenance will be non-viable to ensure public safety.

**In the event of roadway failure, SHA must**

- Respond with an **immediate** plan of action.
- Close unsafe area and detour traffic around the unsafe portion.
- Notify environmental agencies of the emergency operation.
- Repair the failure
- Mobilization is quick and fast.

# Minimal Shift

- Shift roadway
  - Maintain the existing width (approx. 22 to 24-feet)
  - Move roadway away from most critical area **only**
- Repair pipe outfall
- Open and closed section portions

- Extends life expectancy of traffic barrier.
- Rock excavation is needed.
- Minimal stream/ slope work



# Maximum Shift

- Shift roadway
  - Maintain the existing width (approx. 24-feet)
  - Move roadway away from existing and future concerns
- Repair pipe outfall
- Open and closed section portions

- Maximum life of traffic barrier and greatly increases life expectancy of roadway.
- Extensive rock Excavation is needed.
- No stream/ slope work

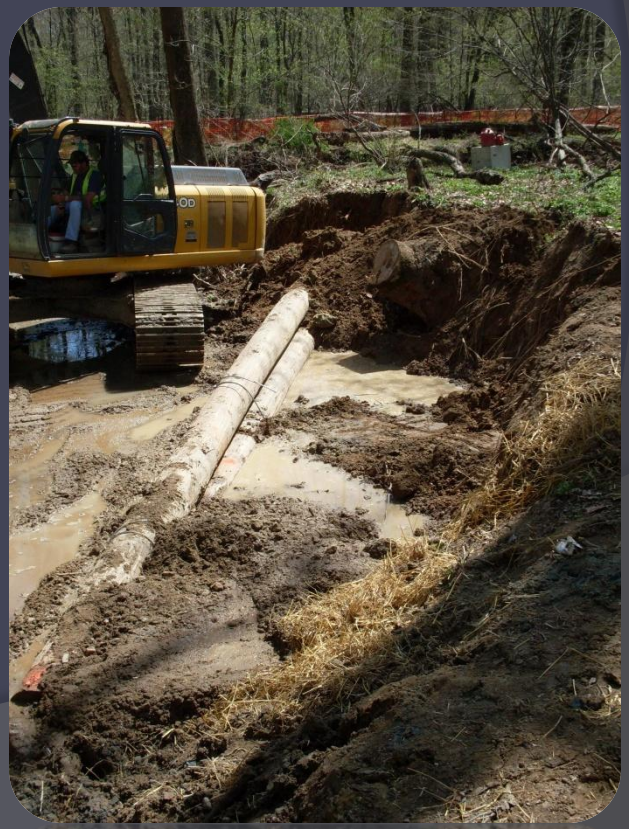
# Slope/ Stream Stabilization

- Imbricated stone wall configured to geometry of the stream.
- Natural materials used.
- Live staking and other aggressive landscaping techniques will be used to limit impact to stream.
- Shallow bedrock
- Temporary stream diversion
- Armoring stream channel
- No rock excavation
- Existing roadway location is maintained
- Utility location is integral.

# *Visited* Concepts

- Root wads/ Log Cribbing
  - Not well suited when storm flow are contained within channel
  - Shallow bedrock may caused excavation during embedment
  - Needs well established vegetation to be sustainable due deterioration.

- Cross Vanes
  - (instream structures)
  - have to be large enough to withstand the instream storms
  - used to control vertical stream degradation to a greater extent and bank protection to some extent.



# Summary & Next Steps

- Concepts have been developed
- Detailed evaluation of concepts and impacts
- Full H/H report
- Permits

- More borings are needed.
- Detailed Design


**Past**
(1934)

**Present**
(actually a few weeks ago)

# Thank You